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| EXAMINER | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/479,304 | RHOADS, GEOFFREY B. | |
| | Examiner | Art Unit | |
| | PONNOREAY PICH | 2135 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *31 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *52-80* is/are pending in the application.

4a) Of the above claim(s) *75-80* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *52-73* is/are rejected.

7)☒ Claim(s) *74* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

**DETAILED ACTION**

This application contains claims 75-80 which are drawn to a non-elected invention. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144). See MPEP § 821.01.

Claims 52-74 were examined.

***Response to Arguments***

Applicant's arguments filed on 3/31/08 were fully considered, but were not persuasive.

On page 9 of the remarks filed, applicant stated that the Office Action withdrew claims 75-80 from consideration without explanation. The examiner respectfully notes that the prior Office Action stated that these claims were withdrawn because they were directed towards a non-elected invention (see page 2 of last OA), thus explanation was given.

On page 9 of the remarks filed, applicant appears to argue that a person of ordinary skill in the art is not someone having at least an MS in Computer/Electrical Engineering and is familiar with steganographic techniques (or someone with equivalent industry experience). Applicant requests a factual foundation for the examiner's statement regarding who a person of ordinary skill in the art is. Applicant pointed out that as a point of reference, the present inventor does not have a computer/electrical engineering degree and rather have a BA degree in physics. Applicant states that MPEP 2141.03 identifies the educational level of the inventor as the first factor to consider in establishing level of ordinary skill.

The examiner respectfully notes that MPEP 2141.03 does not list the educational level of the inventor as a criteria for establishing level of ordinary skill. Instead, it lists the following factors which may be considered in establishing level of ordinary skill:

1. Type of problems encountered in the art.
2. Prior art solutions to those problems.
3. Rapidity with which innovations were made.
4. Sophistication of the technology.
5. Educational level of active workers in the field.

The cited portion of the MPEP further went on to state that in a given case, every factor may not be present. The examiner also directs attention to *Daiichi Sankyo v. Apotex (Fed. Cir. 2007)* in which the courts ruled that the inventors in the particular case were not persons of ordinary skill in the art. With these facts in mind, the examiner will now explain why he believes that a person of ordinary skill is someone having at least an MS in Computer/Electrical Engineering and is familiar with steganographic techniques (or someone with equivalent industry experience).

First, the examiner notes that the present application is directed towards wireless communication systems, cell phone technology in particular and use of steganography within cell phone systems to prevent cell phone fraud. Cell phones are devices which comprise electronic circuits and programs stored within which allows for long distance wireless communication. From this fact of the type of technology used in the present invention, the examiner believes that a person of ordinary skill in the art is someone having experience working with electronic circuits--either a computer engineer or electrical engineer or someone working in industry as a computer or electrical engineer. MPEP 2141.03 states that a person of ordinary skill would of necessity have the capability of understanding the scientific and engineering principles applicable to the pertinent art. Note that the examiner never stated that one must have a degree in computer/electrical engineering to work as a

computer/electrical engineer, but common sense tells us that in most cases someone working as a computer/electrical engineer would have a degree in the field or had worked in the field long enough where they have equivalent knowledge as someone having such a degree. Applicant seems to imply that a person with a physics degree would instead be the more appropriate choice for a person of ordinary skill, but does not offer any explanation as to why this is so other than the fact that the inventor has a physics degree. As pointed out in the above cited case, the inventors may sometimes not be persons of ordinary skill in the art. If applicant has any specific evidence or facts which would establish that a person with a physics degree is instead a person of ordinary skill, then the examiner respectfully requests such evidence be submitted so that it may be entered into record to help future determination as to the level of ordinary skill with respect to the present application.

As to why the examiner believes that at least an MS level degree (or equivalent industry experience) is required for the person of ordinary skill, the examiner respectfully submits that the sophistication of the technology of the present application has to be taken into consideration. Practically applying steganography within cell phone technology is not something that is typically done at the BS level of study in engineering--at least not in the examiner's experience. Instead, such practical application which combines knowledge of wireless communication technology with steganography is most likely done as part of a Masters level project or done by someone in industry having a MS level understanding of telecommunications and steganography. Consider the attached document by Hernandez et al ("Performance Analysis of a 2-D-Multipulse Amplitude Modulation Scheme for Data Hiding and Watermarking of Still Images") which discusses hiding information in a signal, i.e. steganography. At least two of the authors of the paper have at least a Masters of Science in Telecommunication Engineering. Telecommunications Engineering is a type of

Computer/Electrical Engineering. The examiner respectfully submits that active workers in a field pertinent to the present application have at least an MS degree or equivalent industry experience rather than a BA as applicant is implying.

Applicant argues that the rationale of combining Reeds's teachings with Hopper (i.e. that it would do no more than yield the predictable result of a cell phone system which authenticates a cell phone to a base station via use of a steganographically encoded digital signature") is not valid. Applicant states that substitution of voice steganography as proposed by the Office Action does not work in Reeds--it does not permit authentication of a handset as it enters the base station's coverage area as contemplated by Reeds nor does it permit authentication of a handset at the time of call origination. The examiner respectfully disagrees that the combination as proposed by the Office Action would not work in Reeds.

First note that one of the problems Reeds wanted to solve was not only authentication at the time connection is established, but also authentication while the connection is active (col 1, lines 35-39). The initial authentication (via challenge-response) done by Reeds when the cell phone gets into a mobile station's coverage area solves the problem of authentication at the time connection is established. That is, initial connection is allowed because prior authentication was already performed. Authentication when a cell phone enters a mobile station's coverage area is not an end goal in Reeds's invention. It is done to solve the problem of authentication at the time connection is made. However, prior authentication as done by Reeds is not the only way of solving the problem of authentication at the time connection is made. As a person of ordinary skill would understand, every number on a telephone has a unique tone, which is used to determine which number has been dialed and which phone to connect to. Even before a user speaks, the calling phone sends data to the

mobile station indicating which number to connect to. The examiner respectfully submits that steganographically encoding authentication data to the initial dial tone sent from the calling cell phone would also solve the problem of initial authentication which Reeds invention attempts to solve using prior authentication with challenge-response. Steganographically encoding dial tone is no different than encoding voice because both are types of sound. Further, as a person of ordinary skill would understand, the microphone of a cell phone is active even if the user is not speaking, thus one could steganographically encode any signal received from the microphone just prior to connection as the encoded "voice" signal for purposes of initial authentication. As such, contrary to applicant's argument, use of steganography would permit authentication of a handset at the time of call origination as contemplated by Reeds.

Further, note that the office action also went on to explain that use of steganography could also be used in the re-authentication of the cell phone as done by Reeds's invention (col 9, lines 45-63). Re-authentication as done by Reeds is used to solve the above problem noted by Reeds of authenticating while the connection is active. That is authenticating while the call is active. Voice signal is active during a call, thus the use of steganography for re-authentication as discussed in the office action would work in Reeds's invention. The examiner notes that applicant's response does not even address the office action's proposal that steganography be used in place of Reeds's challenge-response system for **re-**authentication, thus is not a complete reply by applicant. Note that as noted in the first paragraph on page 13 of the last office action, a further rationale for why one would want to use steganography in place of Reeds's challenge-response system for (re-)authentication is that redundantly encoding a signal into voice data for identification purposes for Reeds's invention as taught by Hopper would reduce error rate in reception. The benefit of this is readily obvious. Since it

is possible to get an unintended error in Reeds's invention during re-authentication using his challenge-response protocol, unintended dropped call due to failure to re-authenticate may occur. However, if one were to use steganography as discussed in the office action to re-authenticate during a call instead, the error rate of reception of the authentication data would be reduce, thereby reducing the chance of dropped calls.

For the reasons above, a person of ordinary skill would have modified Reeds's invention to use steganography for initial authentication, re-authentication, or both rather than use a challenge-response system. Note that rather than use steganography for both the initial authentication and re-authentication, one could also just use steganography as discussed for re-authentication during calls when voice data is present.

Regarding claim 62, applicant argues that the "dynamics" limitation has been mis-interpreted so as to render it superfluous. Applicant states that if "an encoding signal that depends—in part--on dynamics of the data" were modified so that "dynamics of" were deleted Hooper's arrangement would still apply because the office action construed the limitation in a way that gives "dynamics" no meaning. The examiner respectfully disagrees with applicant that "dynamics" was not given meaning. If one were to delete "dynamics of" from the limitation, one would broaden the claim such that the encoding depends at least in part on any of several aspects of the data--dynamics of the data, the information of the data, format of the data, or any other characteristics of the data. Hopper would still apply, not because dynamics was not given meaning, but because deleting dynamics would broaden the claim such that in also encompassed dynamics of the data or other characteristics of the data.

Applicant argues that Hopper decides whether to encode based on energy magnitude of the speech exceeding a threshold and when the speech is present, which is different than its dynamics.

The examiner respectfully submits that as understood by a person of ordinary skill in the art, when referring to sound, whether or not the sound is present and its magnitude are description of dynamics of the sound. See for example, Jones (US 3,586,781) which refers to the dynamic range of speech signals (col 1, lines 21-34). The dynamic range discussed by Jones refers to how soft or loud the speech is. How soft or loud a speech is relates to how much energy is in the speech—the magnitude of the speech or its volume. Hopper deciding to encode based on whether the speech is present and the energy magnitude of the speech meets the criteria that encoding is done based at least in part on dynamics of the speech/data.

Applicant states that no attention has been paid to the principle that the specification gives meaning to the claim and that the office ignored the most important evidence of the term's meaning: the specification. The examiner respectfully submits that limitations that are not claimed, even if disclosed in the specification cannot be considered. The only time the examiner is aware of in which the specification's meaning has to be given deference is when applicant acts as his/her own lexicographer and specifically defines a term whose meaning is intended to be used in the interpretation of the claim. Applicant has not done this with regards to the dynamics limitation. Applicant has not pointed to any place in the specification nor provided any evidence that the dynamics limitation is intended to have a special meaning. The examiner has not found any evidence of this in the specification. In fact, evidence that applicant meant for the dynamics limitation to have a broader meaning than what is disclosed in the specification exists. Applicant had previously pointed to page 10, lines 1-6 as support for encoding based on dynamics of the data. As far as the examiner can figure out, encoding based on dynamics of the data as discussed in the cited section appears to refer to encoding based on the first, second, or higher order derivative of the voice data. If it is as

applicant is arguing that one must always refer to encoding based on dynamics of the data as encoding based on derivatives of the data, why then does claim 62 only refer to encoding based on dynamics of the data while dependent claim 74 (dependent on claim 62) specifically refer to encoding based on the derivative? If encoding based on dynamics inherently refer to encoding based on derivative of the data, why bother recite a dependent claim which only recites that which is already inherent? The only answer the examiner can come up with is that claim 62 is broader than claim 74 and in fact applicant did not intend for the specification to in any manner limit claim 66's dynamics limitation. The examiner once again notes that the specification does not limit or define the dynamics limitation as applicant is arguing. Applicant's also does not point out what supposed meaning the specification provides for the dynamics limitation.

Applicant notes that independent claim 69 is rejected with reference to claims 55 and 66 but neither claims recite a limitation comparable to the dynamics limitation of claim 69. The examiner notes that citation to claim 66 was a typo and the rejection of claim 69 should have referred to claim 55 and 68 instead. Note claim 68 is dependent on claim 66 and contains all the limitations recited in claim 66 also. Any inconvenience is regretted. The examiner has expanded on the rejection of claim 69 below to avoid any further confusion. The claim is still rejected over Reeds in view of Hopper and further in view of Lee as evidenced by Jones for the same reasons discussed in the rejection of the reference claims thus no new grounds of rejections is made.

Subject matter found in claim 74 is still allowed. The examiner notes that applicant did not address the claim in any manner. It is unclear if this was an oversight or if it was intentional.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

It is submitted that a person of ordinary skill in the art at the time applicant's invention was made is someone having at least an MS in Computer/Electrical Engineering and is familiar with steganographic techniques (or someone with equivalent industry experience).

Claims 52-54, 58-59, 72, 55-57, 60-65, and 70-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reeds, III et al (US 5,204,902) in view of Hopper (US 3,406,344).

**Claim 52:**

Reeds discloses a cell phone including a radio receiver circuitry (Fig 11, item 220), a memory (Fig 11, item 240), a data capture system and a radiant-energy digital data transmission system (Fig 11; col 4, lines 5-9; and col 11, lines 16-27 and 65-66). Note that all cell phones have a data capture system, i.e. microphone for a user to speak into.

Reeds further discloses that the cell phone is characterized in that the cell phone further includes an encoder that alters data captured by the data capture system in accordance with an encoding signal prior to transmission by the data transmission system (col 7, lines 21-34; col 9, lines 28-45; and col 11, lines 21-27). Note that the cited sections discusses that a RAND sequence is broadcasted from a base station to the cell phone. The cell phone uses the RAND sequence as an

input into a Jumble process to generate an encoding signal, i.e. bits of group A, which is used to encode/encrypt the user's speech received by the cell phone before transmission.

Reeds further discloses wherein the encoder is adapted to generate an encoding signal that depends, at least in part, on information received by the radio receiver circuitry and stored in the memory (col 7, lines 21-34; col 9, lines 28-45; col 11, lines 21-27 and lines 65-66). The RAND signal was received by the cell phone and stored in block 240. The encoding signal, i.e. bits of group A, is generated at least in part from the RAND signal received by the cell phone. The RAND signal is interpreted to be the claimed information received by the radio receiver circuitry and stored in the memory.

Reeds does not explicitly disclose that the encoder is a steganographic encoder and the encoding is steganographic encoding and wherein data captured by the data capture system is digitally marked with the encoding signal prior to being transmitted by the data transmission system. However, Hopper discloses use of a steganographic encoder to perform steganographic encoding in a telephone system (col 1, lines 11-21 and 37-62). Note modulating the auxiliary data signal so that it is found in the speech signal's sideband such that the auxiliary signal is transmitted at the same time as the speech signal without interfering with the speech signal in any perceptible manner is steganographic encoding of the speech signal with the auxiliary signal. Hopper also discloses wherein data captured by the data capture system is digitally marked with the encoding signal prior to being transmitted by the data transmission system (col 5, lines 19-20).

At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art to modify Reeds's invention using Hopper's teachings such that rather than use the digital signature in a challenge-response authentication protocol, one instead used steganography to

redundantly encoded the user's voice signal by hiding an auxiliary identification signal (i.e. the digital signature from Reeds's invention) in the voice signal before transmission. The rationale for why it would have been obvious is that combining the prior art elements from Reeds and Hopper's invention would do no more than yield the predictable result of a cell phone system which authenticates a cell phone to a base station via use of a steganographically encoded digital signature.

Note that the RAND signal disclosed by Reeds is used for authentication purposes, and as such the RAND signal would have been an obvious choice to create an auxiliary authentication signal from with which to use in steganographic encoding of the voice signal for line/caller identification purposes as per Hopper's teachings. Reeds discloses that to enhance security the cell phone is re-authenticated periodically (col 9, lines 24-25 and 47-50). Using Hopper's teachings to achieve re-authentication is an obvious choice because Hopper discloses that redundantly encoding a signal into the voice data for identification purposes would reduce the error rate in reception (col 4, lines 65-71). Whenever the base station of Reeds's modified invention wanted to re-authenticate the cell phone, all it has to do is check the authentication data that was steganographically encoded onto the voice data.

**Claim 53:**

Reeds further discloses that the data capture system captures audio, i.e. speech, and includes a microphone (col 9, lines 28-31). Note that all cell phones includes microphones to capture speech from the user.

**Claim 54:**

As per claim 54, Hopper further discloses that the steganographic encoder is adapted to operate transparently to a user of the telephone (col 1, lines 37-41 and col 4, lines 44-58), wherein all

of the data captured by the data capture system and transmitted by the telephone is steganographically encoded (col 4, lines 44-58 and 67-73).

One skilled should appreciate that when two users speak to each other via a telephone system, any delay due to encoding of the signal for transmission is not noticed by the users, i.e. the encoding is transparent to the user. In the cited portions of Hopper, the auxiliary data signal is transmitted at the same time as the voice signal without any action being taken by the user except for the user to speak as he/she would normally do when using a telephone. Hopper's invention continuously monitors for speech energy bursts via detector 13 and only when a burst is detected is the auxiliary data signal supplied for modulation with the speech signal. Further, Hopper discusses that it is preferred that the auxiliary code word is repetitively transmitted in the speech signal. This teaching would lead one of ordinary skill to steganographically encode all of the data captured by the data capture system since doing so would provide the maximum redundancy possible. The telephone being a cell phone is obvious over the additional teaching of Reeds.

**Claim 58:**

Hopper further discloses wherein the steganographic encoder is adapted to additively combine a digital overlay with the data captured by the data capture system (col 3, lines 44-61 and Fig 2, item 30).

Note that the cited portions disclose a code word is redundantly transmitted as a sideband of the speech signal. The examiner is considering the signal created by repeating the code word for transmission as the claimed digital overlay. The speech signal is considered the data captured by the data capture system. Since the auxiliary data signal is transmitted simultaneously with the voice signal in the sideband of the voice signal, the overlay/auxiliary data signal is considered combined

with voice signal. Note that as shown in Figure 2, an adder is used to combine the digital overlay with the voice signal.

**Claim 59:**

Hopper further discloses wherein the steganographic encoder is adapted to generate an overlay signal, i.e. the signal generated from repeating the code word, that is dependent on both a plural-bit auxiliary code and on the data captured by the data capture system (col 4, lines 44-58 and 67-73; col 5, lines 3-30; and col 6, lines 32-35).

Note that the data signal which is encoded onto to the voice signal is made up of code words. The examiner considers these disclosed code words as plural-bit auxiliary codes. In encoding the (auxiliary) data signal onto the voice signal, the cited section in column 5 discusses that the amplitude of the data signal is adjusted so that it does not cause a noticeable distortion in the speech signal. This adjustment to the data signal is done by measuring the magnitude of the speech burst. As such, the generation of the auxiliary data signal, i.e. the claimed overlay signal, is dependent on both the code words, i.e. plural bit auxiliary code, and on the speech bursts, i.e. the data captured by the data capture system.

**Claim 72:**

Hopper further discloses wherein the steganographic encoder is adapted to generate an encoding signal that also depends – in part – on dynamics of the data (col 4, lines 44-58 and 67-73; col 5, lines 3-30; and col 6, lines 32-35).

The examiner considers the auxiliary data signal which is encoded as a sideband signal of the speech signal to be the encoding signal. The cited portion of Hopper discusses how the auxiliary signal is only supplied to the modulator if there is an active voice signal and how the amplitude of the

auxiliary data signal is adapted so that it does not cause appreciable distortion in the speech signal. To do this, the magnitudes of individual speech bursts are measured. In other words, the amplitude of the generated encoding signal, i.e. the auxiliary data signal, is dependent at least in part on the dynamics of the data, i.e. speech signal, as measured by the magnitude of each speech burst and if there is an active speech burst.

**Claim 55:**

Reeds discloses:

1. Receiving input information, i.e. user's speech or voice data (col 4, lines 9-12 and col 9, lines 26-44).
2. Receiving data, i.e. RAND and/or RANDU sequence, wirelessly sent from a remote transmitter (col 7, lines 21-34; col 9, lines 28-45; col 11, lines 21-27 and lines 65-66).
3. Encoding the input information, the encoding depending, at least in part on the received data (col 7, lines 21-34; col 9, lines 28-45; col 11, lines 21-27 and lines 65-66). *Note that the RAND signal is used to create a group of bits, i.e. group A, which is used to encode/encrypt speech data. As such the encoding/encryption depends at least in part on the received RAND signal.*
4. Transmitting the encoded information by wireless in a digital format (col 4, lines 9-12; col 9, line 28-44; and col 11, lines 16-35).

Reeds does not explicitly disclose the encoding is steganographically encoding to hide a plural-bit auxiliary code and that the data transmitted is steganographically-encoded information; wherein the input information is digitally marked with the plural-bit auxiliary code prior to being transmitted. However, Hopper discloses steganographically encoding a plural-bit auxiliary code, i.e.

code word, in received input information, i.e. voice data, and that the information transmitted from the telephone is steganographically-encode information (col 1, lines 11-21 and 37-62). Hopper further discloses the input information is digitally marked with the plural-bit auxiliary code prior to being transmitted (col 5, lines 19-20).

At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art to modify Reeds's invention according to the limitations recited in claim 55 in light of Hopper's teachings by steganographically encoding the digital signature formed in Reeds's invention onto voice data as per Hopper's teachings. The rationale for why it would have been obvious to combine Reeds and Hopper's teachings to arrive at the invention as recited in claim 55 is the same as what was discussed in claim 52.

**Claim 56:**

Reeds further discloses:

1. Receiving the input information in a non-digital form (col 9, lines 28-44 and col 11, lines 21-27). *One skilled should appreciate that human speech is analog in nature. As such when the cell phone's microphone is used to receive the speech into the cell phone, the speech is received in analog format. Further evidence of this is that the information has to be converted into digital format. This means that the information was not in digital format when received.*
2. Expressing the received information in digital format (col 9, lines 28-44 and col 11, lines 21-27).
3. Encoding the digital form of the input information (col 9, lines 28-44).

**Claim 57:**

Reeds further discloses wherein the input information is audio information, i.e. speech (col 9, lines 28-44).

**Claim 60:**

Hopper further discloses wherein the steganographic encoding includes additively combining a digital overlay signal with the input information (col 3, lines 44-61 and Fig 2, item 30).

Note that the cited portions disclose a code word is redundantly transmitted as a sideband of the speech signal. The examiner is considering the signal created by repeating the code word for transmission as the claimed overlay signal. The speech signal is considered the data captured by the data capture system. Since the auxiliary data signal is transmitted simultaneously with the voice signal in the sideband of the voice signal, the overlay/auxiliary data signal is considered combined with voice signal, i.e. input information.

**Claim 61:**

Hopper further discloses wherein the steganographic encoding includes combining an overlay signal with the input information (col 4, lines 44-58 and 67-73; col 5, lines 3-30; and col 6, lines 32-35).

Note that the cited portions disclose a code word is redundantly transmitted as a sideband of the speech signal. The examiner is considering the signal created by repeating the code word for transmission as the claimed overlay signal. The speech signal is considered the data captured by the data capture system. Since the auxiliary data signal is transmitted simultaneously with the voice signal in the sideband of the voice signal, the overlay/auxiliary data signal is considered combined with voice signal, i.e. input information.

**Claim 70:**

Hopper further discloses wirelessly communicating an identifier from the cell phone, wherein said plural-bit auxiliary code is at least partially redundant with said identifier, so that at least part of said identifier is sent from the cell phone in two different manners (col 4, lines 67-73).

**Claim 71:**

Reeds further discloses wherein said plural-bit auxiliary code comprises an identifier uniquely identifying the cell phone, rather than identify the input information or a user of the cell phone (col 7, lines 26-33).

**Claim 62:**

The limitations recited in claim 62 can all also be found in claims 52, 55, and 72 and as such, claim 62 is rejected over Reeds and Hopper for similar reasons discussed in claims 52, 55, and 72.

**Claim 63:**

Hopper further discloses the steganographic encoder is adapted to control an amplitude of the encoding signal, i.e. the auxiliary data signal, in part, in accordance with dynamics of the data, i.e. the speech signals (col 5, lines 3-30).

The examiner considers the auxiliary data signal which is encoded as a sideband signal of the speech signal to be the encoding signal. The cited portion of Hopper discusses how the amplitude of the auxiliary data signal is adapted/controlled so that it does not cause appreciable distortion in the speech signal. To do this, the magnitudes of individual speech bursts are measured. In other words, the amplitude of the generated encoding signal, i.e. the auxiliary data signal, is dependent at least in part on the dynamics of the data, i.e. speech signal, as measured by the magnitude of each speech burst.

**Claim 64:**

The limitations further recited in claim 64 are substantially similar to limitations found recited in claim 52 and as such claim 64 is rejected for similar reasons discussed in claim 52.

**Claim 65:**

Most of the limitations recited in claim 65 are also found in claims 52 and 55 and these limitations are rejected for similar reasons discussed in claims 52 and 55. Claim 65 additionally recites "the steganographic encoder being adapted to introduce a pseudo-random signal to the data in which the hidden plural-bit auxiliary code is encoded". This limitation reads on encrypting the steganographically encoded data signal using a randomly generated key. Official notice is taken that encrypting signals with a random key was well known in the art. At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art to further modify Reeds's invention such that the steganographic encoder was encrypted by introducing a pseudo-random signal to the data after the data signal was encoded by hiding the plural-bit auxiliary code within the data signal. One skilled would have been motivated to do so because it would ensure private communication on the cell phone. One skilled would have been motivated to use a pseudo-random signal as the encryption key because they offer a high level of security. Note that in just relying on steganography alone, an eavesdropper can still listen in on a cell phone call electronically. Note that Reeds was interested in encryption of the speech data (col 9, lines 24-25).

**Claim 73:**

Hopper further discloses data (i.e. voice) comprises a series of samples, and the steganographic encoder is adapted to generate an encoding signal that depends on the dynamics of several samples (col 4, lines 44-57).

Claims 66-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reeds, III et al (US 5,204,902) in view of Hopper (US 3,406,344) and further in view of Lee et al (US 5,687,191) and as evidenced by Jones (3,586,781).

**Claim 66:**

Most of the limitations recited in claim 66 are also found in claims 52 and 55 and these limitations are rejected for similar reasons discussed in claims 52 and 55. Claim 66 additionally recites "the host data comprising sample values, and the steganographic encoder being adapted to increase certain of the sample values and decrease others." Hopper discloses the host data, i.e. voice data, comprising sample values, i.e. speech bursts (col 4, lines 44-49 and col 5, lines 3-30).

Reeds and Hopper do not explicitly disclose the steganographic encoder being adapted to increase certain of the sample values and decrease others. However, the Lee discloses an encoder adapted to normalize sample values (col 7, lines 34-44). Normalization of the amplitude implies that the amplitude of samples that were above the mean value were decreased, while the amplitude of samples that were below the mean value were increased.

At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art to further modify Reeds and Hopper's combination invention according to the limitations recited in claim 66 in light of Lee's teachings by having the steganographic encoder disclosed by Hopper also normalize sample values. One skilled would have been motivated to do so because as evidenced by Jones, speech signals typically vary over a dynamic range, some being very loud, i.e. having high amplitude, while others are very soft, i.e. having low amplitude, and modulating the amplitude of the speech samples so that they were more uniform, i.e. normalized, would improve the quality of transmissions (Jones: col 1, lines 28-36 and 65-69).

**Claim 67:**

Reeds, Hoper, and Lee do not explicitly disclose wherein the steganographic encoder is adapted to increase certain of the sample values between 7.5% and 100%. However, as discussed in claim 66, as per Lee's teachings, it would improve transmission if the amplitude of the host data, i.e. voice samples, were normalized. This would mean that the amplitude of some of the samples would be increase, while some were decreased. It would not be unexpected that in normalizing some of the samples having low amplitude that the amplitudes may increase anywhere from 7.5% and 100%. It would not be unreasonable to assume that one of ordinary skill would try different percentages of increasing the amplitude of the lower amplitude samples and in routine experimentation find that some of the samples should be increased anywhere from 7.5% to 100% to achieve better quality of transmission.

**Claim 68:**

The limitations further recited in claim 68 are similar to what is recited in claim 72 and are rejected for similar reasons. Note that the encoding referred to in claim 72 is steganographic encoding to hide the plural-bit auxiliary code as recited in claim 68.

**Claim 69:**

Reeds discloses:

1. Receiving sampled input information, i.e. user's speech or voice data (col 4, lines 9-12 and col 9, lines 26-44).
2. Encoding the input information (col 7, lines 21-34; col 9, lines 28-45; col 11, lines 21-27 and lines 65-66).

3. Transmitting the encoded information from the cell phone in a digital format (col 4, lines 9-12; col 9, line 28-44; and col 11, lines 16-35).

Reeds does not explicitly disclose the encoding is steganographically encoding to hide a plural-bit auxiliary code and that the data transmitted is steganographically-encoded information; wherein the steganographically encoding comprises—in a pseudo-random fashion--increasing the values of certain samples and decrypting the values of other samples, the increasing and decreasing depending, in part, on dynamics of the sampled input information, and wherein the input information is digitally marked with the plural-bit auxiliary code prior to being transmitted.

However, Hopper discloses steganographically encoding a plural-bit auxiliary code, i.e. code word, in received input information, i.e. voice data, to hide the plural-bit auxiliary code and that the information transmitted from the telephone is steganographically-encode information (col 1, lines 11-21 and 37-62). Hopper further discloses the input information is digitally marked with the plural-bit auxiliary code prior to being transmitted (col 5, lines 19-20). Hopper further discloses wherein the steganographic encoder is adapted to generate an encoding signal that also depends – in part – on dynamics of the data (col 4, lines 44-58 and 67-73; col 5, lines 3-30; and col 6, lines 32-35). Since the encoding depends on the dynamics of the data, the encoding is done in a pseudo-random fashion.

The examiner considers the auxiliary data signal which is encoded as a sideband signal of the speech signal to be the encoding signal. The cited portion of Hopper discusses how the auxiliary signal is only supplied to the modulator if there is an active voice signal and how the amplitude of the auxiliary data signal is adapted so that it does not cause appreciable distortion in the speech signal.

To do this, the magnitudes of individual speech bursts are measured. In other words, the amplitude of the generated encoding signal, i.e. the auxiliary data signal, is dependent at least in part on the dynamics of the data, i.e. speech signal, as measured by the magnitude of each speech burst and if there is an active speech burst.

Further, Lee discloses an encoder adapted to normalize sample values (col 7, lines 34-44). Normalization of the amplitude implies that the amplitude of samples that were above the mean value were decreased, while the amplitude of samples that were below the mean value were increased. This reads on encoding by increasing the values of certain samples and decrypting the values of other samples.

It would have been obvious to one of ordinary skill in the art to combine the teachings of Reeds, Hooper, and Lee according to the limitations recited in claim 69 in light of the above. One skilled would have combined their teachings for the same reasons discussed in claims 55 and 66.

***Allowable Subject Matter***

Claim 74 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Note that while best effort was made to cite the portions of the references which show the limitations being rejected, however, other portions of the references noted above may be relevant. Applicant should fully review all sections of the references.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PONNOREAY PICH whose telephone number is (571)272-7962. The examiner can normally be reached on 9:00am-4:30pm Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Vu can be reached on 571-272-3859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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